

REVISION OF THE AUSTRALASIAN GENERA *AGRAPHYDRUS* RÉGIMBART,
CHASMOGENUS SHARP AND *HELOCHARES* MULSANT
(COLEOPTERA: HYDROPHILIDAE)

C. H. S. WATTS

WATTS, C. H. S. 1995. Revision of the Australasian genera *Agraphydrus* Régimbart, *Chasmogenus* Sharp and *Helochares* Mulsant (Coleoptera: Hydrophilidae). *Records of the South Australian Museum* 28(1) 113–130.

The Australian and New Guinean members of the Hydrophilid genera *Agraphydrus*, *Chasmogenus* and *Helochares* are revised and redescribed. A key to the genera and species is given. Fourteen species are recognised of which six are described as new: *H. (Hydrobaticus) marreensis*; *H. (Hydrobaticus) percyi*; *H. (Hydrobaticus) anthonyae*; *H. (Hydrobaticus) thurmerae*; *H. (Hydrobaticus) loweryae*; and *H. (Hydrobaticus) dahuntyi*. *H. (Hydrobaticus) australis* Blackburn is synonymised with *H. (Hydrobaticus) tristis* Macleay. *H. (Hydrobaticus) luridus* W. Macleay is resurrected from synonymy with *H. tristis* W. Macleay.

C. H. S. Watts, South Australian Museum, North Terrace, Adelaide, South Australia 5000.
Manuscript received, 25 May 1994.

The three genera under discussion are small aquatic Hydrophilidae belonging to the tribe Hydrophilini, subtribe Acidocerina, which are characterised by lack of a sternal keel, head not strongly deflexed, middle and hind tibiae without swimming hairs, maxillary palpi larger than antennae and with pseudobasal segment, straight or curved, with convexity on inside, and the mesosternum without projecting longitudinal laminae. Until recently they were all included in the genus *Helochares* Mulsant, 1844 but were reinstated as full genera in the extensive revision of the Hydrophiloids by Hansen (1991).

As well as Australia and New Guinea, species of *Helochares* are widespread in both the old and new world, *Chasmogenus* Sharp, 1882 in Neotropical, Oriental and Palearctic regions and *Agraphydrus* Régimbart, 1903 in East Africa, Southern Asia and Japan.

D'Orchymont (1925, 1939, 1943) revised *Chasmogenus* and *Helochares*, including all the Australian and New Guinean species then known. The genera and various subgenera of the group are readily recognised but within them the species are difficult to distinguish. D'Orchymont noted that in *Chasmogenus* the characters of the aedeagus are the only reliable means of separating species. I have found this to be true for several *Helochares* species also.

Specimens of *H. (Hel.) foveicollis* (Montrouzier, 1860) and *C. nitescens* Fauvel, 1883 are often mistaken for species of *Enochrus*

Thomson, 1859 but can be separated by the maxillary palps having the pseudobasal segment bent inwards in *Helochares* and *Chasmogenus* rather than outwards as in *Enochrus*. *Helochares* and *Chasmogenus* also lack the simple protuberance in the ventral midline in front of the mesocoxae present in *Agraphydrus*.

Within *Helochares*, eleven of the twelve Australian species belong to the subgenus *Hydrobaticus* W. MacLeay, 1871, which is readily recognised by its strongly punctate surface with distinct striae or rows of punctures on elytra. All but one species (*H. anchoralis* Sharp, 1890) are endemic to the region and only two are known from both New Guinea and Australia. In contrast, the subgenus *Helochares* lacks strong sculpture and is represented, in Australasia, by a single species which is also widespread in South-east Asia and the Pacific Islands. The single Australasian species of *Agraphydrus* and *Chasmogenus* are tropical with a wide distribution in South-east Asia as well as Australasia.

Most species in the group are tropical but one *H. (Hyd.) tristis* Macleay, 1871, is common in southern Australia and another *H. (Hyd.) tenuistriatus* Régimbart, 1908 is found only in the south-west of Western Australia.

All species are inhabitants of shallow still water or slow moving well-vegetated streams. Females of *H. (Hyd.) tristis* are often taken with a large white coloured eggmass attached to the ventral surface of the abdomen. The larvae of *H. tristis*

and *C. nitescens* have been described by Anderson (1976) but I know of no studies of the ecology of any Australasian species.

Hansen (1991) provides a comprehensive taxonomic discussion of these genera, including detailed generic description and phylogenetic analysis.

The collections from which specimens were examined are listed under the following abbreviations:

- AM Australian Museum, Sydney
- ANIC Australian National Insect Collection
- BELG Institut royal des sciences Naturelles de Belgique, Bruxelles
- BM(NH) Natural History Museum, London
- CW Private collection of author
- FIELD Field Museum of Natural History, Chicago
- MNHN Museum National d'Histoire Naturelle, Paris
- NMV Museum of Victoria
- NTM Northern Territory Museum
- QDPIM Queensland Department of Primary Industries, Marreba
- QM Queensland Museum, Brisbane
- SAMA South Australian Museum, Adelaide
- UQIC University of Queensland Insect Collection, Brisbane
- WAM Western Australian Museum, Perth

SYSTEMATICS

The genera *Agraphydrus*, *Chasmogenus* and *Helochares* can be separated from other Hydrophilids by the following characters: Head not strongly deflexed; scutellum not, or not much longer than its basal width; meso- and metatibia without swimming hairs. Antennae with eight or nine segments, maxillary palpi elongate, longer than antennae, last segment shorter than penultimate. Mesosternum without projecting carina in midline. Meso- and metasterna without a continuous keel. Elytra not strongly carinate. Curved basal joint of maxillary palpus with convexity at front.

Generic and subgeneric diagnoses are given in the key. More extensive generic diagnoses are given by Hansen (1991).

KEY TO AUSTRALASIAN SPECIES OF *AGRAPHYDRUS*
RÉGIMBART, *CHASMOGENUS* SHARP AND *HELOCHARES*
MULSANT

- 1 — Small size (< 3 mm); head predominantly black; pronotum and elytra yellow-brown; elytra sparsely punctured, punctures not in stria. Male genitalia relatively simple; aedeagus divided into upper and lower sections (Figs 13 & 14)
Agraphydrus coomani d'Orchymont
- Not with above combination of characters2
- 2 — Black. Elytral striae virtually lacking, at most reduced to a few lines of serial punctures.....3
- Predominately brown. Each elytron with 10 complete striae. *Helochares*, subgenus *Hydrobaticus*.....4
- 3 — Smaller (< 5.0 mm). Sutural stria strongly impressed in at least apical half of elytra. Dorsal surface weakly punctured, punctures on head smaller than eye facets, subobsolete on scutellum
Chasmogenus nitescens Fauvel
- Larger (> 6.0 mm). No sutural stria. Dorsal surface with well marked punctures, those on head larger than eye facets. Scutellum with sharply impressed punctures*Helochares sensu stricto* *H. foveicollis* (Montrouzier)
- 4 — Punctures on pronotum of uniform size except for small punctures close to front margin (Fig. 18).....8
- Punctures on pronotum of two sizes (Fig. 19).....5
- 5 — Numerous large punctures on front of head, particularly laterally, not greatly different in size and density to those on rest of head.....6
- Punctures on centre of head small, with only a few scattered larger ones, larger and more numerous laterally and on back half of head (Fig. 17). Large and small punctures on pronotum and in elytral interstriae very different in size (Fig. 19)*H. clypeatus* Blackburn
- 6 — Strial punctures close, often confluent and tending to form grooves, interstitial areas raised towards apex accentuating grooves (Fig. 23). (Punctures on elytron margin

- strong at front grading to weak apically.) Male genitalia as in Fig. 5.....
*H. luridus* Blackburn
- Strial punctures for most part not confluent and not forming grooves except toward apex to slight degree in some specimens (Fig. 22).....7
- 7 — Male genitalia as in Fig. 4. Most of the smaller interstitial punctures more than ½ diameter of larger ones
*H. tenuistriatus* Régimbart
- Male genitalia as in Fig. 3. Most of the smaller interstitial punctures less than ⅓ diameter of the larger ones (Fig. 20)
*H. tristis* Macleay
- 8 — Punctures on head smaller than size of eye facets. (Serial punctures relatively small, confluent, forming grooves. Body size 5.5–6.2 mm.) Flanges of clytra with large punctures much larger than those in interstriae. Only known from New Guinea
*H. anchoralis* Sharp
- Punctures on head larger than eye facets (except in *H. anthonyae*, a species with serial punctures on elytral disc not confluent). Punctures on flanges of elytra, other than in *H. tatei*, a much smaller species (body size 3.4–4.8 mm), usually smaller than those in adjacent interstriae..9
- 9 — Interstitial punctures at base of elytra (and often over rest of elytra as well) large, equal in size to the serial punctures which are also relatively large
*H. marreensis* sp. nov.
- Interstitial punctures on elytra smaller than those in elytral stria (Fig. 21). Punctures in elytral stria also tend to be small (large in *H. tatei*).....10
- 10 — Punctures on head and pronotum very large, most about a quarter puncture width apart or less (Fig. 18). Number of punctures along midline of pronotum more than 30. Flattish species with elytra broadly and weakly flanged, somewhat truncate apically. Body length relatively large (> 4.8 mm)*H. percyi* sp. nov.
- Punctures on head and pronotum small to medium, many separated by half puncture width or more (except in some *tatei*). Punctures on pronotum larger laterally. Number of punctures along midline of pronotum 20–40.....11
- 11 — Number of punctures along midline of pronotum around 25. Punctures in elytral striae as large or larger than those on pronotum, interstitial punctures tend to increase in size laterally even prior to lateral fringe. Interstitial punctures between stria 8 and 9 usually in single line. Body length relatively small (<4.8 mm).....*H. tatei*
- Number of punctures along midline of pronotum around 35. Other characters usually not as above.....12
- 12 — Strial punctures in inner few rows diminish in size down apical declivity. (Distance between stria apically greater than 2 puncture widths apart. Surface of elytra towards apex has a very flat appearance).....*H. anthonyae* sp. nov.
- Strial punctures in apical quarter, apart from last few, do not diminish in size and may even increase in size.....13
- 13 — Lateral stria with 30 or fewer punctures. (Strial punctures relatively large.)
*H. thurmerae* sp. nov.
- Lateral stria with more than 30 punctures
*H. loweryae* sp. nov.
or *H. dalhuntii* sp. nov.

***Agraphydrus* Régimbart**

Type species: Agraphydrus punctatellus Régimbart, 1903, Madagascar. Designation by monotypy.

***Agraphydrus coomani* (d'Orchymont)**

Helochares (Agraphydrus) coomani d'Orchymont, 1927

Description (number examined 51)

Length 1.4–2.6 mm. Narrowly oval, head broad in front giving it a blunt-nosed appearance. Yellow-brown. Head black except laterally in front of eyes, disc of pronotum and elytra variably darker, tips of maxillary palpi black, underside dark brown except for yellow-brown appendages. Front of head broadly and weakly concave, sparsely covered by weakly impressed small punctures. Pronotum and elytra weakly reticulate, sparsely covered with small weakly impressed punctures, those on elytra more strongly impressed laterally. A number of barely traceable lines of serial punctures on each elytron. Maxillary palpi

relatively short and stout, apical segments a little larger than penultimate, basal segments a little larger than apical. Rugose portions of femur covering all but about apical quarter. Tibia with several rows of strong spines. Metacoxae and abdominal segments quite densely covered by well marked punctures, much stronger and denser than those on dorsal surface. Apical sternite weakly notched apically. Midline of metacoxae shining apically. Midline of metasternum very weakly and broadly ridged.

Male: Protarsi and claws a little stouter than in female; claws on protarsi more strongly recurved than in female. Aedeagus as in Figs 13 and 14.

Types

Holotype: Not located in d'Orchymont collection BELG. Type locality, Latho near Hoa Binh, Tonkin, Vietnam.

Distribution (Australasian only)

Northern Territory

Cooper Creek, ANIC; 14 km NW Cape Crawford, ANIC; McArthur River, ANIC; Pine Creek, CW; Yuendumu, CW.

Queensland

16°28'S, 144°46'E, ANIC; Bushy Creek, Julatten, ANIC; Charters Towers, CW; 75 km Cooktown, ANIC; Mary Creek, ANIC; Mossman, Mt Lewis Road, ANIC; Mulgrave, ANIC.

New South Wales

Armadale, CW; Cabbage Tree Creek, ANIC.

Western Australia

Millstream, ANIC; 5 km SE Millstream, ANIC.

Papua New Guinea

Kokoda, BELG

Remarks

This small species is relatively common in collections from northern Australia. These specimens agree well with d'Orchymont's detailed description and with specimens, I take to be of this species, from Lenggong Malaya Peninsula in SAMA. There is a male specimen in BELG mounted on a card with genitalia extruded labelled as 'Papua: Kokoda 1 200 ft. VIII. 1933. L. E. Cheesman, B.M. 1933-577', 'Paratype', 'Borona laevigata, M. J. Balfour-Browne det'. 'A. d'Orchymont, det., *Helochares* (*Agraphydrus*) *laevigatus*. J. Balf.-Browne'. I can find no reference in the literature to this name and assume it is an unused name.

Chasmogenus Sharp, 1882

Type species: *Chasmogenus fragilis* Sharp, 1882, Central America; designation by monotypy.

Chasmogenus nitescens (Fauvel)

Philydrus nitescens Fauvel, 1883

Enochrus nitescens (Fauvel, 1883); Knisch 1924

Helochares (*Crephelochares*) *nitescens* (Fauvel, 1883); d'Orchymont 1939

Description (number examined 161)

Length 2.5–5.0 mm. Narrowly oval. Black. Clypeus, edges of pronotum, lateral margins of elytra often reddish, appendages testaceous. Front edge of head broadly and shallowly concave, a weak notch in front margin of head in some specimens. Dorsal surface with small weakly impressed well-separated punctures. In addition a few larger punctures in row across front of head and between front edges of eyes and pronotum with two fields of larger punctures on either side of midline towards front and a field of a few larger ones on each side in middle; each elytron with three or four ill-defined rows of well separated large serial punctures. Each elytron with sharply impressed sutural stria in apical half to three quarters, diverging somewhat toward front close to suture apically. Scutellum lacking punctures or with a few weak ones. Maxillary palpus long, slender, apical segment about two-thirds length of penultimate, first and second segments subequal. Femur with rugose portion covering all but small portion near apex. Coxal plates seemingly impunctate, but rugose and moderately covered with setae rather as on femurs, bare shiny area in midline apically. Abdominal sternites similarly sculptured; a well-developed but relatively low metasternal keel present. Apex of apical abdominal segment with small notch. Aedeagus as in Fig. 15, although there is considerable variation among the specimens examined.

Types

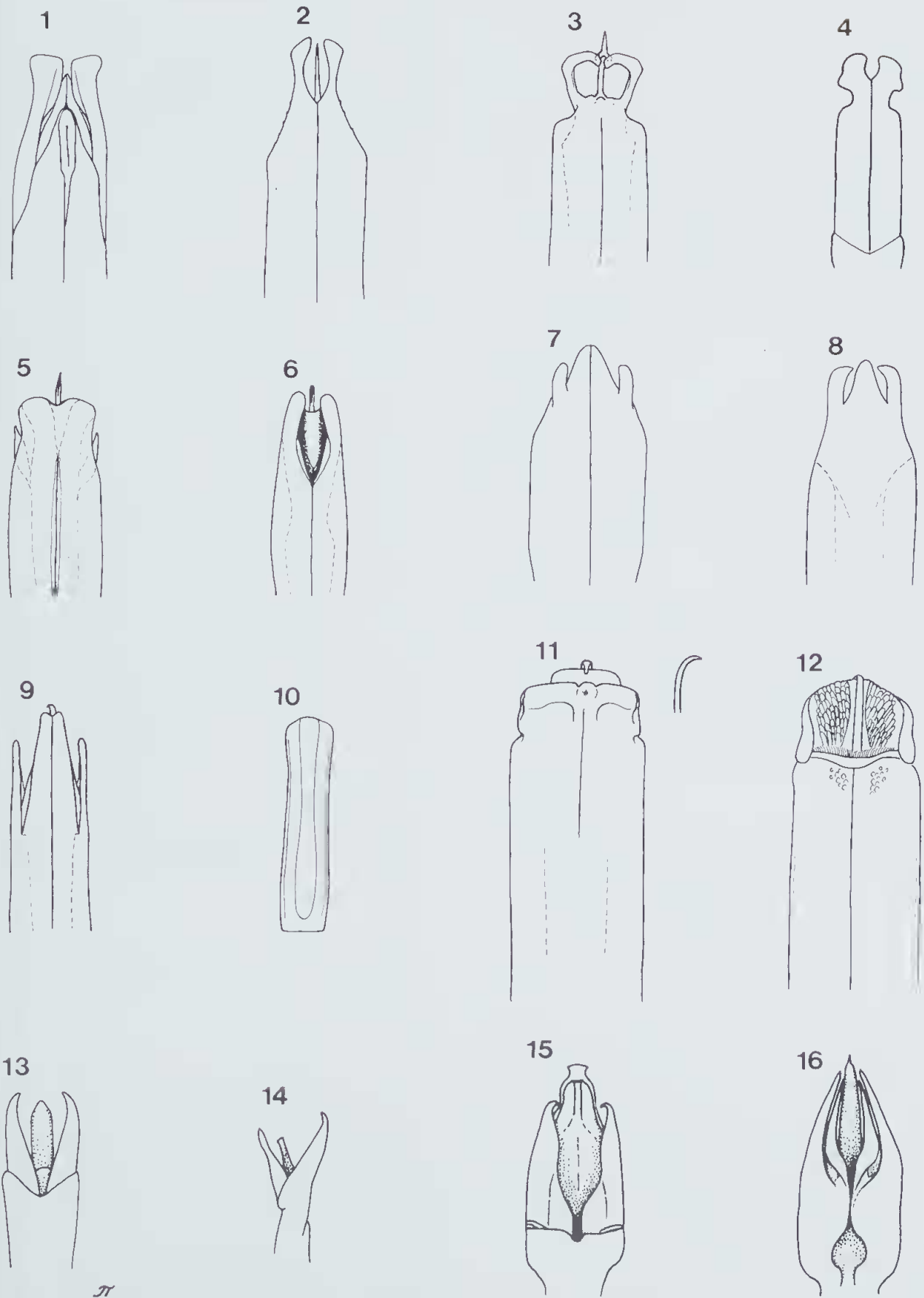
Lectotype male: 'Anse Vata – marass d'eau douce – août – savés, 'Nouvelle Calédonie', bearing original det label. 'Philydrus nitescens Fvl', in BELG, herein designated.

Paralectotypes: 3, – same data as lectotype, in BELG, herein designated.

Distribution

Northern Territory

Black Point, Coburg Pen., ANIC; Katherine, ANIC; 8 km N Mt Cahill, ANIC; 19 km NE by E



FIGURES 1-16. Tip of aedeagus. All are ventral views except for additional dorsal (12) and lateral (14) views of species as follows; 1 *H. anthonyae*; 2 *H. clypeus*; 3 *H. tristis*; 4 *H. tenuistriatus*; 5 *H. luridus*; 6 *H. tatei*; 7 *H. loweryae*; 8 *H. dalhuntii*; 9 *H. thurmerae*; 10 *H. percyi*; 11 *H. anchoralis*; 12 *H. anchoralis*; 13 *A. coomani*; 14 *A. coomani*; 15 *C. nitescens*; 16 *H. foveicollis*.

Mt Cahill, ANIC; Nourlangie Creek, ANIC; 6 km SW by S, Oenpelli, ANIC.

Queensland

Ayr, ANIC; 5 ml [8 km] N Bloomfield River, ANIC; Cairns, BELG; Cape Tribulation, ANIC; 3 km S by W Cooktown, Mission Beach, ANIC; Giru, ANIC; Hann River, N. Laura, QDPIM; Innisfail, ANIC; 7 km NE Innisfail, ANIC; Mt Webb National Park, ANIC; Townsville, ANIC; 3 km ENE Mt Tozer, ANIC; 9 km ENE Mt Tozer, ANIC; 11 km ENE Mt Tozer, ANIC; 5 km W by N Rounded Hill, ANIC; 9 km SE Yeppoon, ANIC.

New South Wales

Yuragin, NP, ANIC.

Papua New Guinea

Lae, BMNH; 7 ml [11 km] Lae-Bulolo Road, BMNH; Gusap Markham Valley, ca 90 ml [145 km] W of Lae, BMNH.

Remarks

I have examined type material of *C. abnormalis* (Sharp, 1890), *C. simulator* (Kuwert, 1922), *C. livicornis* (Kuwert, 1889), *C. ferrugatus* (Régimbart, 1903) and *C. nigritulus* (Régimbart, 1903) and consider the Australian specimens to differ from all of these. This appears to be the only *Chasmogenus* in Australia.

Helochaeres Mulsant, 1844

Helochaeres Mulsant, 1844

Hydrobaticus W. Macleay, 1871

Neohydrobius Blackburn, 1898

Type species: Hydrobaticus: Hydrobaticus tristis W. Macleay, 1871, Gayndah, Queensland; designation by d'Orchymont (1943). *Helochaeres: Dytiscus lividus* Forster, 1771, Europe. *Neohydrobius: Philhydrus burrunderiensis* Blackburn, 1890, Northern Territory, Australia; designation by Blackburn (1890).

Subgenus *Helochaeres*

Helochaeres (Helochaeres) foveicollis (Montrouzier)

Stagnicola foveicollis Montrouzier, 1860

Philhydrus burrunderiensis Blackburn, 1890; syn. nov. *Neohydrobius burrunderiensis* (Blackburn,

1890), Blackburn 1889; syn. nov. ?*Helochaeres atropiceus* Régimbart, 1903

Helochaeres (Helochaeres) foveicollis (Montrouzier, 1860); Knisch 1924; d'Orchmont 1943

Helochaeres (Helochaeres) burrunderiensis (Blackburn, 1890); Knisch 1924; syn. nov.

Description (number examined 356)

Length 6.1–8.2 mm. Broadly oval. Black. Front edge of head, margins of pronotum, lateral margins of elytra and apical portions of appendages testaceous. Front edge of head sinuate. Head and pronotum with small to medium sized (for genus) punctures, well impressed, separated by about width of a puncture. Punctures on side of head a little stronger and denser. Punctures on elytra same size or somewhat smaller than those on pronotum and a little sparser, particularly towards sides and apex. A sparse row of serial punctures traceable in about middle of each elytron and another weaker row near lateral margin. Maxillary palpus long, slender, second segment largest, apical segment about two-thirds length of middle one. Femur with rugose portion covering all but small portion near apex. Coxal plates sparsely and weakly punctured, covered in moderately impressed fine reticulation. Sternites shiny, covered with relatively sparse, small setose punctures; apex of apical sternite with small notch. Weak to well developed metasternal keel, highest apically.

Male: Aedeagus as in Fig. 16. Protarsi enlarged. Claws on protarsi strongly recurved, inner one with large scale-like vertical expansion at its base; claw on mesotarsi similar in shape but not quite as developed.

Female: Protarsi about two-thirds size of male's, claws simple; mesotarsi a little smaller than in male, claws simple.

Types

P. burrunderiensis: Syntypes: 1 in BM(NH) 'T 2769' 'Philhydrus burrunderiensis, Blackb.' with BM(NH) Type and Blackburn coll 1910–236 labels. 1 'NT, N. Territory', 'Neohydrobius burrunderiensis Blackb., Co-type', in SAMA, 1 'Philhydrus burrunderiensis, B1'. Co-type, in SAMA.

I am uncertain of the status of these types. The BM(NH) specimen is without locality label but is mounted on a card with a black 'T' and a red number in typical Blackburn style and carries the species label in Blackburn's handwriting. I have little doubt that this was meant as the holotype.

The first presumed syntype in SAMA fits Blackburn's style, except for his use of *Neohydrobius* as the generic name which was not described until nine years later by Blackburn (1898). The second presumed syntype in SAMA bears a single label not in Blackburn's hand. At some stage this specimen was remounted upside down. In his 1898 publication, Blackburn mentions original specimens. I am inclined to believe that all three specimens are part of the original series and that the two SAMA specimens were re-examined and relabelled when Blackburn described *Neohydrobius*. I nominate the BM(NH) specimen as lectotype and the two SAMA specimens as paralectotypes.

S. foveicollis: Not located. The type is supposedly in the Bedel Collection in MNHN but cannot be found there or in other collections in MNHN (Y. Cambefort in litt.). A specimen in MNHN from New Caledonia appears identical to Australian specimens and it is on this basis that I synonymise the species. d'Orchymont (1943) came to the conclusion, based on very limited material, that the two forms were very close and probably conspecific.

H. atropiceus Régimbart. Syntypes. 2 in MNHN seen. This New Guinean species appears to me to be very similar if not conspecific with *H. foveicollis*. According to d'Orchymont (1943) it is a junior synonym of *H. taprobanicus* (Sharp, 1890) from Ceylon and differs from *H. foveicollis* by its sculpture and male genitalia. I have not, however, looked closely at these non-Australasian forms and prefer to leave the question of whether or not they are conspecific open at the moment.

Distribution

Northern Territory

3.2 km S Adelaide River, ANIC; Alligator River, MV; Black Point, Coburg Pen., ANIC; Borroloola, ANIC; 22 km WSW Borroloola, ANIC; 5 km NNW Cahills Crossing, ANIC; 8 km ESE Cape Crawford, ANIC; Cooper Creek, ANIC; Darwin, SAMA, CW; 96.5 km S Darwin, ANIC; Edith River, ANIC; Elcho Island, ANIC; Holmes Jungle, ANIC; Horn Islet, Pellew Group, UQIC; Humpty Doo, QDPIM; Katherine, ANIC; Koongarra, ANIC; Magela Creek, ANIC, SAMA; Mataranka, ANIC; McArthur River, ANIC; Melville Island, ANIC; 10 km E by N Mt Cahill, ANIC; Nabarlek Dam, ANIC; Nourlangie Creek, SAMA; Pine Creek, CW; Rimbija Island, ANIC; Roper River, ANIC; South Alligator River, ANIC; Tindal, ANIC.

Queensland

Ayr, ANIC; Bamaga, ANIC, UQIC; Bentinck Is., SAMA; Burnett River, ANIC; Cairns, SAMA; Cape Tribulation, QM; Cardstonc, ANIC; Carnarvon Range, AM; Clerrmont, AM; 19.3 km WNW Cooktown, ANIC; 40 km N Cooktown, ANIC; 50 km N Cooktown, QM; Cow Bay, QDPIM; Darwin, CW; E Alligator, AM; Green Hills, ANIC; Home Hill, CW; 7 km N Hope Vale Mission, ANIC; Innisfail, AM, SAM; Iron Range, ANIC, AM; 15 km W Irvinebark, ANIC; Kirrama, ANIC; 75 km NW of Laura, QDPIM; Mackay, MV; 80 km S Mackay, UQIC; Mission Beach, UQIC; Mornington Is. Mission, SAMA; 5 km ESE Mt Finnigan, ANIC; 9 km ENE Mt Tozer, ANIC; 3 km NE Mt Webb, ANIC; Mutchilba, MV; 8 km S of Putty, ANIC; Renilworth State Forest, UQIC; 5 km W by N Rounded Hill, ANIC; 40 mile Scrub, ANIC; Shiptons Flat, ANIC; South Johnstone, QDPIM; 15 km WNW South Johnstone, QDPIM; Stewart Range, BELG; Strathmore Stn., QDPIM; Toowoomba, ANIC; Townsville, CW, FIELD, MV, QDPIM; 9.6 km SSE Yeppoon, ANIC.

New South Wales

2.4 km E Freshwater River, AM; Kyogle, AM; Valery, ANIC.

Australian Capital Territory

Black Mountain, ANIC.

Western Australia

4 km SSW Cape Bertholet, ANIC; Derby, WAM; Fitzroy Crossing, ANIC; 161 km E Kununurra, ANIC; Mitchell Plateau, ANIC; Wyndham, UQIC.

Papua New Guinea

1.6 km S Morehead, ANIC; Rouku, Western District, ANIC.

Noumea

Noumea, MNHN.

Remarks

Very distinct from other Australasian *Helochares*, by its size, shiny black colour and virtual lack of elytral stria.

Subgenus *Hydrobaticus* W. Macleay, 1871

Helochares (Hydrobaticus) anchoralis Sharp

Helochares anchoralis Sharp, 1890

Helochares crenatus expansus Knisch, 1921, 1924; d'Orchymont 1943

Helochares (Hydrobaticus) anchoralis expansus Knisch, 1921; d'Orchymont 1943

Description (number examined 7)

As for *H. tristis* except as follows. Length 5.5–6.2 mm. Upper surface shiny, reddish brown with scattered, ill-defined darker areas near border of head and Y suture outlined in black. Head uniformly covered in small-medium sized moderately dense punctures; pronotal punctures of uniform size, small for genus, separated from each other by their own diameter or a little less, a few larger setiferous setae in one line towards front on each side; serial punctures of elytra confluent, small, those at base about same size as those on pronotum, somewhat larger towards apex and laterally; interstitial punctures numerous, moderately dense, smaller than those in stria; area between elytron edge and most lateral striae densely covered in large punctures, the more lateral ones as large or larger than those in adjacent striae. Elytron flanged. Striae form deep grooves laterally and apically but interstitial areas flat. Aedeagus as in Figs 11 and 12.

Distribution

Papua New Guinea

Finisterre Mts, Budemu, ca 1220m, BMNH; Gusap Markham Vale, 145 km W of Lae, BMNH; Lae-Bulolo Road, BMNH; 11 km Lae-Bulolo Road, BMNH; Port Moresby, BMNH.

Remarks

I have not seen the types of either *H. anchoralis* Sharp, or *H. c. expansus* Knisch, and rely on d'Orchymont (1943) for my identification of this species. The series of specimens in the BMNH agree with Sharp and d'Orchymont's descriptions, and with the aedeagus illustrated by d'Orchymont. Among Australasian *Hydrobaticus* with uniform punctation, the species is distinctive by being large and relatively flat with broad elytral flanges and the punctures on the head smaller than the size of the eye facets. Outside New Guinea the species is widespread in South East Asia from Ceylon (type locality) to the Philippines. The type locality of *H. c. expansus* Knisch is given only as New Guinea.

Helochares (Hydrobaticus) anthonyae sp. nov.

Description (number examined 76)

As for *H. tristis* except as follows. Length 4.5–

5.8 mm. Yellow-brown. Front and rear of head, Y suture on head, portions of pronotum, serial punctures on elytra and often a quite extensive area on disc of elytra darker. Punctures on head moderate in size and density, somewhat smaller towards front in middle; punctures on pronotum of uniform size, moderately sized, separated from each other by their own diameter or slightly less; stria punctures well impressed, not confluent, not forming grooves, at least twice size of those on pronotum, becoming progressively smaller in apical quarter of elytron; interstitial punctures very small, much smaller than stria punctures except towards apex where the serial punctures are much reduced in size. Sides of pronotum and elytra with fine reticulation giving mat finish. Edges of elytra not or only very weakly flanged.

Types

Holotype malc: 'New Guinea: Morobe Dist., c 7 ml [11 km] Lae-Bulolo Rd. 30.xii.1964', 'Stn No. 120', 'M.E. Bacchus, BM 1965-120', in BM(NH).

Paratypes: 9 in BM(NH); 2 in SAMA; 2 in CW; all with same data as holotype

Distribution

Northern Territory

Nourlangie Creek, ANIC.

Papua New Guinea

Lae, BMNH; 7 mls [11 km] Lae-Bulolo Road, BMNH; 90 mls [145 km] W. of Lae; Mt Lamington, BMNH; Okapa, E. Highlands District, BMNH.

Remarks

Apart from the distinctive aedeagus (Fig. 1), separated from other *Helochares*, particularly *H. loweryae*, *H. dalhuntii* and *H. thurmerae*, by characters given in key. A New Guinean species known from only one Australian specimen from the Northern Territory

Helochares (Hydrobaticus) clypeatus (Blackburn)

Hydrobaticus clypeatus Blackburn, 1891
Helochares (Hydrobaticus) clypeatus (Blackburn, 1890); Knisch 1924; d'Orchymont 1943

Description (number examined 377)

As for *H. tristis* except as follows. Length 5.1–7.2 mm. Some ill-defined dark patches on elytra.

Punctures on front of head fine, with a few much larger ones (Fig. 17); punctures on rear of head, pronotum and elytra of two sizes, the smaller similar to those on front of head, the larger much larger, in approximately equal numbers except on elytra where they are smaller and more numerous; large punctures on pronotum often separated by less than their diameter (Fig. 19); serial punctures a little larger, often confluent and forming shallow grooves. Interstrial areas virtually flat apically. Aedeagus as in Fig. 2.

Types

Holotype female: 'T 3434NT', 'Hydrobaticus clypeatus, Blackb.' in BM(NH).

Distribution

Northern Territory

1 km NE of Cahills Crossing, East Alligator River, ANIC; Berry Springs, ANIC; Bessie Spring, ANIC; Coastal Plains Research Station, CSIRO, Darwin, ANIC; Cooper Creek, ANIC; 16 km E of Daly River, SAMA; Howard Springs, ANIC; 10 km N Jabiru, QDPIM; Kakadu NP, NTM; Kapalga, QM; Koongarra, ANIC; Manton Reservoir, NTM; 19 km NE by E Mt Cahill, ANIC; 2 km N of Mudginbarry HS, ANIC; Nourlangie Creek, ANIC; Oenpelli, ANIC; Simpson Gap, ANIC.

Queensland

Atherton, ANIC; Ayr, ANIC; 8 km N Bloomfield River, ANIC; Boar Pkt Road, ANIC; Brisbane, CW, UQIC; Brookfield, QM; Caloundra, CW; Cape Tribulation, CW; Cairns, ANIC, CW, SAMA; Cape Flattery Road, QDPIM;



FIGURE 17. Head of *H. clypeatus*.

Cardstone, ANIC; Cardwell, ANIC; Carungra Creek, QM; Cooloola, QM; Cow Bay, QDPIM; Emerald, QDPIM; Flinders Island, SAMA; Fraser Island, ANIC; Home Hill, CW; Gayndah, UQIC; Groomeri, UQIC; Hann River N of Laura, QDPIM; Hann River, 73 km NW Laura, ANIC; Helenvale, ANIC; Hope Vale Mission, ANIC; Innisfail, CW; Kuranda, ANIC, SAMA; Lam. Nat. Pk, UQIC; 75 km NW Laura, QDPIM; Mareeba, QDPIM; McIlwraith ANIC, QDPIM; 16 km S Miriam Vale, UQIC; Mission Beach, UQIC; Mossman, ANIC; Mourilyan, ANIC; 3 km NE Mt Webb, ANIC; North Pine River, UQIC; Nth Stradbroke Island, UQIC; 11 km WSW Petford, QDPIM; Petrie, UQIC; 15 km NW of South Johnstone, QDPIM; Tinaroo Dam, QDPIM; Tolga, QDPIM; 7 km N Tolga, QDPIM; Townsville, ANIC; Upper Mulgrave River, UQIC; Walkamin, QDPIM; 40 km S of Weipa, QDPIM; 80 km N Weipa, NMV; Woodford, UQIC.

New South Wales

Coffs Harbour, UQIC; Congo, ANIC; Kyogle, FIELD; Lansdowne SF, ANIC; 8 km W of Port Macquarie, ANIC; 18 km W of Uki, ANIC; Valery, ANIC; Windsor, ANIC; Wootton, ANIC.

Western Australia

Carson Escarpment, ANIC.

Remarks

A distinctive species best recognised by the form of punctuation on the upper surface in which the large and small punctures are very different in size (Fig. 19). This character is difficult to describe in a key but once recognised is readily used. The sparsity of large punctures on the front portion of the head (Fig. 17) is usually a reliable character but does not separate all *H. clypeatus* from all *H. tristis*.

Helochares (Hydrobaticus) dalhuntii sp. nov.

Description (number examined 30)

As for *H. tristis* except as follows. Length 4.2–5.5 mm. Oval. Dark testaceous; patches of lighter colour on upper surface particularly laterally and at bases of elytra, palpi and tarsi lighter. Front margin of head deeply and widely concave. Punctures on head and pronotum uniformly sized, small for *Helochares*, separated by less than own diameter in most cases, somewhat larger laterally; punctures in elytral interstriae numerous (Fig. 21), much smaller than those on pronotum, a row of larger seta-bearing punctures inwards from striae

six; punctures in stria variably confluent, deeply impressed, much larger than those on pronotum. Aedeagus as in Fig. 8.

Types

Holotype male: right hand specimen of two mounted on card, 'Dalhunny River, Qld, 1/10/83, C. Watts', in SAMA.

Paratypes: 1, mounted upside down on same card as holotype in SAMA; 3, mounted on same card, same data as holotype, in CW; 1, 'Captain Billy Creek, CW', in CW.

Distribution

Queensland

Captain Billy Creek, CW; Dalhunny River, CW; East Claudie River, UQIC; Iron Range, ANIC, AM, UQIC; 2 km NNE Mt Tozer, ANIC; 3 km ENE Mt Tozer, ANIC; 6 km ENE Mt Tozer, ANIC; 8 km E by N of Mt Tozer, ANIC; 9 km ENE Mt Tozer, ANIC; 11 km ENE Mt Tozer, ANIC.

Northern Territory

Darwin, CW; Roderick Creek, Gregory NP, NTM.

Remarks

Helochares dalhuntyi is difficult to separate from *H. loweryae* except by the aedeagus. The punctuation of the upper surface is stronger than in all but a few *H. loweryae*, but I have been unable to reliably quantify this difference.

Helochares (Hydrobaticus) loweryae sp. nov.

Description (number examined 25)

As for *H. tristis* except as follows. Length 4.4–5.5 mm. Oval. Light testaceous; patches of darker colour on dorsal surface. Front margin of head deeply and widely concave. Punctures on head and pronotum uniform in size, small for genus, separated by about own diameter or less in most cases, only slightly larger laterally; punctures in elytral interstriae numerous, much smaller than those on pronotum, a row of large setose punctures inwards from stria 6; interstriae sub-obsolete apically, on shoulders and between lateral-most striae; punctures in stria separate, deeply impressed, much larger than those on pronotum, larger towards sides than on disc; lateral punctures on elytra small but well impressed, larger than those in adjacent interstriae. Aedeagus as in Fig. 7.

Types

Holotype male: 'Mt Lamington, N.E. Papua, 1300 to 1500 feet, C. J. McNamara', in SAMA.

Paratypes: 1, 'New Guinea: Morobe Dist., Lae-Bulolo Rd, 30.xii.1964'. 'Stn. No. 131', in BM(NH). 1, 'New Guinea: Morobe Dist., Gusap, Marthany Valley, c. W. of Lae. 22–30.i. 1965'. 'M.E. Bacchus, BM 1965–120'. 'Stn. No. 166', in BM(NH). 1, 'New Guinea: Morobe Dist., c. 7 ml Lae-Bulolo Rd. 30.xii.1964'. 'Stn. No. 120'. 'M.E. Bacchus, BM 1965–120', in BM(NH). 1, 'New Guinea: Morobe Dist. Herzog Mts., Vagau. c. 4,000 ft 4–17.i.1965'. 'M. E. Bacchus, BM 1965–120', in CW.

Distribution

Northern Territory

Darwin River Reservoir, NTM; Holmes Jungle, ANIC; Howard Springs, CW, NTM.

Papua New Guinea

Bulolo, BM(NH); Kokoda, BM(NH); Morobe District, BM(NH); Mt Lamington, SAMA; Lae-Bulolo Road, BM(NH); 5 km Lae-Bulolo, BM(NH); 11 km Lae-Bulolo, BM(NH); 145 km W. of Lae, BM(NH); Vagav, Herzog Mts. BM(NH).

Remarks

The specimens from the Northern Territory differ from typical specimens by having somewhat stronger interstitial punctures and having the lateral 'wings' of the aedeagus (Fig. 8) more separate from the centre piece than in New Guinea specimens. Close to *H. dalhuntyi* and difficult to separate from it other than by the shape of the aedeagus. Most specimens can be separated by the different strength of the dorsal punctuation but this is difficult to use unless specimens of both species are available. The Northern Territory specimens appear intermediate in this regard.

Helochares (Hydrobaticus) luridus (W. J. Macleay)

Hydrobaticus luridus W. J. MacLeay, 1871

Description (number examined 144)

As for *H. tristis* except as follows. Length 3.5–5.4 mm. Larger punctures usually smaller than those of *H. tristis*, serial punctures usually confluent over most of elytra forming quite strong grooves, interstitial areas towards apex of elytra and laterally weakly ridged, ridging effect

accentuated by relatively deeply indented striae; lateral punctures around clytron get progressively smaller towards apex where they are usually less than one quarter diameter of those towards front corner of elytron (Fig. 23). Aedeagus as in Fig. 5.

Types

Holotype, ?scx. 'Hydrobaticus luridus McL.W. Gayndah' 'K1924' with small circular red label and red Holotype label, in AM.

Distribution

Northern Territory

16°02'S, 130°23'E, NTM; 16°07'S, 130°24'S, NTM; 16°07'S, 130°25'E, NTM; Sth Alligator River, QM; Cooper Creek, ANIC, SAMA; Fergusson River, ANIC; Gregory NP, NTM; Howard Springs, ANIC; Humbert River, NTM; Humpty Doo, QDPIM; Junction of Arnhem Hwy. and Oenpelli Road, NTM; Oenpelli Road, NTM; Kakadu, NTM; Katherine, SAMA; Larrimah, QM; 13 km S Lawn Hill Stn., QM; McArthur River, ANIC; 19 km E by N of Mt Cahill, ANIC; 19 km WSW Mt Cahill, ANIC; 19 km NE by E Mt Cahill, ANIC; 12 km NNW Mt Cahill, SAMA; 2 km N Mudginbarry HS, ANIC; Nabarlek Dam, ANIC; 18 km E by N of Oenpelli, ANIC; Renner Springs, CW; Tennant's Creek, NMV; 12 km NNE Victoria River Downs, ANIC.

Queensland

Annan River, ANIC; Ayr, ANIC; Barron Falls, ANIC; Brookfield, QM; 29 km S Burketown, QM; Burnett River N of Eidswald, ANIC; Cardstone, ANIC; Cairns, ANIC, Charleville, ANIC; 25 km N Coen, CW; Cooktown, ANIC, CW; 40 km N Cooktown, ANIC; Cunnamulla, AM, SAMA; Daintrec, ANIC; Dalby, SAMA; Dipperu, QM; Ellery Creek, NMV; Gayndah, SAMA; 12 km SE Gympie, NMV; Innisfail, QM; Iron Range, UQIC; Laura, CW; 73 km NW by W Laura, ANIC; 75 km NW Laura, QDPIM; Little Laura River, QM; Mary Creek, ANIC; McIlwraith Range, CW; 34 km S Mirian Vale, ANIC; Mossman, ANIC, SAMA; Mt Garnet, CW; 3 km ENE Mt Tozer, ANIC; 14.5 km W Paluma, ANIC; 11 km NSW Petford, QDPIM; Rockhampton, SAMA; Rocklea, QM; 15 km NNW South Johnstone, QDPIM; Station Creek, ANIC; Strathmore Station, QM; Tolga, QM; 7 km NE Tolga, QDPIM; Townsville, AM.

New South Wales

Valery, ANIC.

Western Australia

Carson Escarpment, ANIC; Kalumburu, ANIC; Mitchell Plateau, ANIC; 5 km SE Pago Mission, FIELD.

Remarks

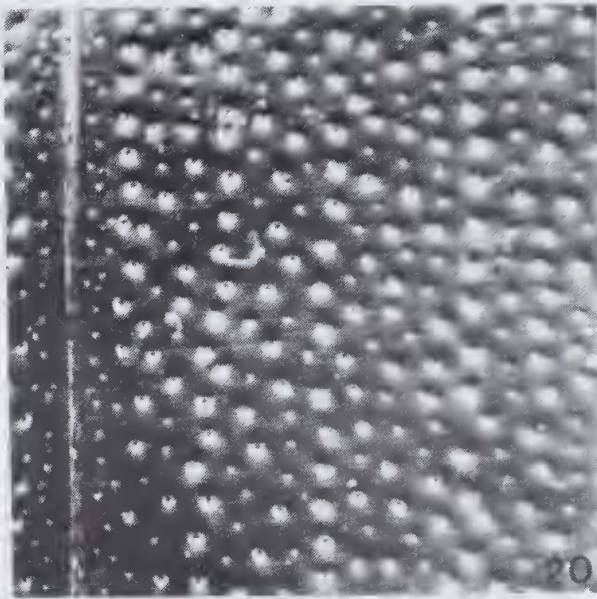
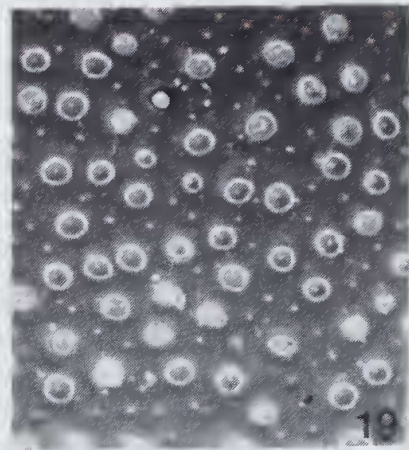
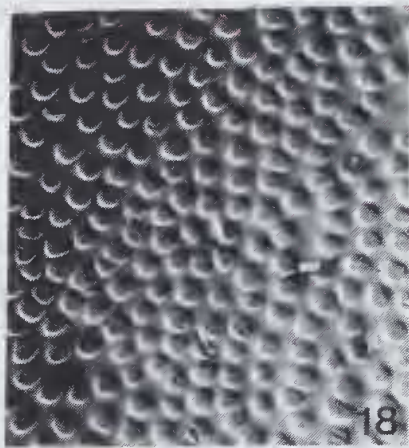
The distinctive aedeagus (Fig. 5) is the only reliable character separating *H. luridus* from *H. tristis*. Over most of its range *H. tristis* has no trace of elytral ridging or indented stria, which are almost always a feature of *H. luridus*. Unfortunately it is in the area of distributional overlap in southern Queensland that the two species are hardest to separate since most *H. tristis* from this area have quite well marked apical ridging and grooving on elytra. The character used in the key—small lateral punctures at apex of elytron in *H. luridus*—appears to work, but is often difficult to see clearly and, at best, is a subjective character.

H. luridus was synonymised with *H. tristis* by Knisch (1924), Zaitzev (1908) and by d'Orchymont (1943). These species are very similar, but readily differentiated by the aedeagus. The holotypes of both species are from Gayndah in southern Queensland where both species are known to occur. Both types are fragile and I think females. I have not attempted to dissect them. The type of *H. luridus* is paler and is almost identical to a male specimen of the northern species from Gayndah in SAMA. The type of *H. tristis* is darker and agrees in diagnostic features with the southern form.

Helochares (Hydrobaticus) marreensis sp. nov.

Description (number examined 147)

As for *H. tristis* except as follows. Length 4.0–5.4 mm. Elongate, reddish-brown including clypeus. Darker markings on head and pronotum vague and often absent, elytra rather evenly speckled brown and reddish-brown or, in some examples, with linear dark lines. Punctures on head numerous, dense, large at base, grading to quite small in front; punctures on pronotum even, moderately large, most separated by less than their diameter, particularly towards sides; punctures in interstriae numerous, strong, those at base near suture about same size as those on pronotum, becoming smaller towards rear and sides of elytra; striae punctures almost confluent, weakly impressed, same size or slightly smaller than those on pronotum and base of elytron. I have been unable to distinguish the aedeagus from that of *H. tatei* (Fig. 6).



FIGURES 18–23. 18 Pronotal disc of *H. percyi*; 19 Pronotal disc of *H. clypeatus*; 20 Portion of elytral disc of *H. tristis*; 21 Portion of elytral disc of *H. dalhuntyi*; 22 Tip of elytron of *H. tristis*; 23 Tip of elytron of *H. luridus*.

Types

Holotype male: '12°23'S 132°56'E, 7 km NW by N of Cahills Crossing, East Alligator River, NT, 27.v.73, E.G. Matthews', in SAMA.

Paratypes: 3, '12°26'S 132°56'E, Cahills Crossing, NT, East Alligator River, 29.v.73, at light, E.G. Matthews', in SAMA; 2, '12°48'S 132°42'E, Nourlangie Creck, NT, 8 km N of Mt Cahill, 21.v.73, at light, E.G. Matthews', in SAMA; 2, '12°25'S 132°58'E, 1 km N of Cahills Crossing, NT, East Alligator River, 7.vi.73, Upton and Feeham', in ANIC; 2, '12°46'S 132°39'E, 12 km NNW of Mt Cahill, NT, 15.vi.73, Upton and Feeham', in ANIC; 1, '12°23'S 132°56'E, 7 km NW by N of Mt Cahills Crossing, East Alligator River, NT, 9.vi.73, Upton and Feeham', in ANIC; 3, 'Forbes, NSW, 15.iii.63, E.W.', in CW.

*Distribution***Northern Territory**

16°02'S, 130°23'E, NTM; Adelaide River, ANIC; Baroalba Creek Springs, ANIC; 13 km SW Borroloola, ANIC; 30 km NE by E Borroloola, ANIC; 1 km N Cahills Crossing, SAMA, ANIC; 5 km NNW Cahills Crossing, ANIC; 7 km NW by N Cahills Crossing, SAMA, ANIC; Cahills Crossing, SAMA, ANIC; Cooper Creek, SAMA, ANIC; Daly River, ANIC, NMV; Fogg Dam, NTM; Howard Springs, CW; 10 km N Jabiru, QDPIM; Junction of Arnhem Hwy and Oenpelli, NTM; Katherine, ANIC; Koongarra, ANIC; McArthur River, ANIC; 13 km N Mt Cahill, SAMA; 9 km N by E Mudginbarry HS, ANIC; 6 km SW by S Oenpelli, ANIC, SAMA; Renner Springs, SAMA; Tindal, ANIC; U.D.P. Falls, NTM; 30 km N Wauchope, ANIC.

Queensland

Bunya Mountains, ANIC; 16 km S Miriam Vale, UQIC; Crystal Creek, ANIC; Cunnamulla, QM, SAMA; Dalby, QM, SAMA; 68 km East Roma, QM; 96 km E Hughenden, UQIC; Julia Creek, CW; Marina Plains, QDPIM; 16 km S Miriam Vale, UQIC; Musgrave HS, ANIC; Nocundra, ANIC; Normanton, SAMA; Silver Plains, UQIC.

New South Wales

Canowindra, VM; Forbes, CW; Gilgandra, CW; Moree, SAMA; Mt Kaputar, ANIC.

Victoria

Lake Hattah, ANIC, QDPIM; Wyperfield National Park, ANIC.

Western Australia

3 km S Coulomb Pt, ANIC; Fitzroy Crossing, ANIC; Kununurra, ANIC; Lennard River Xing, WAM.

South Australia

Marree, SAMA.

Remarks

An elongate, parallel sided species with strong interstitial punctures which, over most of elytra, are as large as the stria punctures. Uniquely, among Australasian species at least, the aedeagi of *H. marreensis* and *H. tatei* are so similar that I have not been able to distinguish them. The two species are readily separated by the punctuation of the upper surface which is much stronger in *H. marreensis*, and the presence of more than one row of punctures in interstriae 7–8 and 9–10 in *H. marreensis* compared to a single row in *H. tatei*.

Helochares (Hydrobaticus) percyi sp. nov.*Description* (number examined 101)

As for *H. tristis* except as follows. Length 4.8–6.0 mm. Oval, rather flattened. Yellow-brown. Clypeus darker, extreme sides of pronotum and elytra lighter. Punctures on head and pronotum large, dense, of uniform size (Fig. 18), those at sides of pronotum and head slightly larger and closer together; interstitial punctures small to medium, dense, uniform in size; serial punctures nearly confluent, deep, larger than punctures on pronotum. Interstitial areas weakly ridged near apex and laterally. Aedeagus as in Fig. 10.

Types

Holotype male: 'Boar Pkt.Rd., N.Q. 2 12.70 J.G. Brooks', in ANIC.

Paratypes: 1, 'Boar Pkt.Rd., N.Q. 1/70 J.B.' 'J.B.B. 27' J.G. Brooks. Bequest, 1976, in ANIC; 1, 'Boar Pocket Road, ca 8 km N of Gillies Hwy, Qld 21.ii.70, at light, J. G. Brooks', ANIC; 2, 'McIlwraith Rng., Weather Stn., N. Qld, 23/7/82, C. Watts', in SAMA.

*Distribution***Northern Territory**

Adelaide River, ANIC.

Queensland

Atherton, QDPIM; Brisbane, UQIC; Cardstone, ANIC; Cairns, CW; Eidsvold, ANIC; Emu Vale, UQIC; 8 km N of Gillies Highway, ANIC; 12 km

SE Gympie, NMV; 37 km SSE Ingham, ANIC; Iron Range, UQIC; Jimboomba, ANIC; Julatten, UQIC; Kenilworth State Forest, AM; Koombaloo, BM(NH); Kuranda, ANIC; 18 km W Mareeba, QDPIM; McIlwraith Range, Weather Stn., CW; 117 km NW by W Laura, ANIC; Mossman, ANIC; Mt Finnigan, ANIC; Mt Spec, ANIC; Oxley Creek, QM; Palmerston National Park, ANIC, UQIC; 24 km W of Paluma, ANIC; Nth Pine River, QM; Sth Pine River, QM; 32 km S of Ravenshoe, ANIC; 15 km WNW South Johnstone, ANIC; Tolga, QDPIM; Wilson's Peak, UQIC.

New South Wales

Armada, CW; Blue Mountains, ANIC; Canterbury, SAMA; Coffs Harbour, UQIC; 12 km N Eccleston, NMV; 9 km SW Gloucester, NMV; Hastings River, ANIC; Nepean River, ANIC; Salisbury, UQIC; Taree, ANIC; 18 km W of Uki, ANIC; Wahroonga, ANIC.

Australian Capital Territory

Black Mountain, ANIC.

Western Australia

Carson Escarpment, ANIC.

Remarks

A broad flat species with large close-packed punctures on pronotum (Fig. 18). Many specimens have broad, weakly-flanged elytra often distinctly truncated at apex. A wet area species common in north Queensland but present as far south as the Blue Mountains and the Australian Capital Territory.

Helochares (Hydrobaticus) tatei (Blackburn)

Hydrobaticus tatei Blackburn, 1896

Helochares (Hydrobaticus) tatei (Blackburn, 1896), Knisch 1924; d'Orchymont 1943

Description (number examined 483)

As for *H. tristis* except as follows. Length 3.4–4.8 mm. Elongate oval, elytra variegated light and dark-brown. Head and pronotum quite densely covered with large well impressed punctures, a little larger laterally, most punctures on pronotum separated by less than half their widths; interstitial punctures on elytra fine, numerous, those in interstriae 7-8 and 9-10 (ignoring short innermost stria) arranged in single loose row; stria punctures large, much larger than punctures on pronotum, mostly confluent, deeply impressed, forming stria

grooves, interstitial area flat. Aedeagus as in Fig. 6.

Types

Syntypes: One, in NMV mounted on a card labelled 'Reedy Ck.' and bearing labels, 'Cent. Aust. Coll. Horn. Exp. Pres. 7.94', 'Hydrobaticus tatei, Blackb', in addition it has a modern red label with 'Type' printed on it; two specimens on the same card on which is written 'T Co-type 5484 Palm Ck.' in Blackburn's hand and labelled 'Hydrobaticus tatei Blackb.' in SAMA; One specimen labelled '5484 Palm Ck, Hydrobaticus tatei Blackb. co-type' in SAMA; ten specimens in NMV mounted two to a card on each of which is written 'Palm Ck.' in Blackburn's hand; two of these are labelled 'Cent. Aust. Coll. Horn. Exp. Pres. 7.97' and 'Hydrobaticus tatei Blackb. det. by Blackb.', one pair bears only the locality label, another only the species label and the last pair has no label. All are clearly from the same series as the other syntypes.

Since the use of 'T' to denote his Holotypes was a normal practice of Blackburn's. I consider the specimen in SAMA so labelled to be the specimen intended by Blackburn as the Holotype. I nominate it as the lectotype and all the other specimens mentioned above as paralectotypes.

Distribution

Northern Territory

Adelaide River, BELG, ANIC; Berry Springs, ANIC; 33 km SW Borroloola, ANIC; 7 km NW by N of Cahills Crossing, East Alligator River, ANIC; Cahills Crossing, East Alligator River, ANIC; Coastal Plains Station, ANIC; Cooper Creek, ANIC; Darwin, BELG, CW; Fogg Dam, ANIC, NTM; Howard Springs, CW, NTM; Huckitta, ANIC, SAMA; Humpty Doo, ANIC; Jim Jim Creek, ANIC, SAMA; Junction Arnhem Hwy and OcnPELLI Road, NTM; Kakadu N P, NTM; Katherine, ANIC; Koongarra, ANIC; Magela Creek, ANIC; Manton Reservoir, NTM; McArthur River, ANIC; 16 km E by N of Mt Cahill, ANIC; Mt Gilruth, QM; 9 km N by E of Mudginbarry HS, ANIC, SAMA; Nourlangie Creek, ANIC; 18 km E by N. of OcnPELLI, ANIC; 4.8 km S Renner Springs, SAMA; South Alligator R., ANIC, QM; 6.5 km W Timber Creek, SAMA.

Queensland

Archer River, ANIC; Archer Bend, CW; Boggy Creek, ANIC; 25 km N, Coen, CW; NW by W. Laura, East Claudie River, UQIC; 60 km S, Coen, CW; Colosseum Creek, 16 km S Miriam Vale,

UQIC; Cooktown, ANIC; Dalhenty River, CW; Hann River, 73 km S of Coen N. CW; Hann River, 110 km S of Coen N. NMV; Iron Range, UQIC; Mornington Island Mission, SAMA; 3 km ENE Mt Tozer, ANIC; Musgrave, ANIC; Normanton, SAMA; Rockhampton, ANIC.

New South Wales

32 km SSW Bourke, SAMA; Whitton, SAMA.

Western Australia

21°31.55 S., 119°06.57 E, WAM; Beverley Springs, WAM; Behn River, SAMA; 172 km SSE of Carnarvon, ANIC; Carson escarpment, ANIC; Charnely River, 40 km N, Beverley Springs, WAM; Dampier Island, FIELD; Drysdale River, ANIC; Milstream, ANIC, WAM; Mitchell Plateau, ANIC, FIELD; 8 km NNE Mt Broome, WAM; Murchinson River, ANIC; 5 km S, Pago Mission, FIELD; Woodstock Station, WAM.

South Australia

Arkaroola Creek, SAMA; Brachina Creek, SAMA; Mt Chambers Gorge, CW, SAMA; 16 km E Curdimurka, SAMA; Eringunda Valley, SAMA; Salt Creek, SAMA; Wilpena Pound, SAMA.

New Caledonia

Grotte de Ninain Rev Poya, SAMA.

Remarks

Resembles *H. (H.) marreensis* in its narrow shape and similar male genitalia. *H. tatei* can be separated from this species by having interstitial punctures much weaker than those in adjacent striae and having only one row of punctures in interstriae 7–8 and 9–10. As far as I know this is the first record of this species from New Caledonia.

Helochares (Hydrobaticus) tenuistriatus Régimbart

Helochares tenuistriatus Régimbart, 1908

Helochares (Hydrobaticus) tenuistriatus Régimbart, 1908; Knisch 1924; d'Orchymont 1943.

Description (number examined 9)

As for *H. tristis* except as follows. Length 5.2–6.5 mm. Oval. Distinctly reddish, upper surface with darker markings. Front margin of head broadly concave. Punctures on head and pronotum of two sizes, smaller $\frac{1}{4}$ – $\frac{1}{2}$ diameter of larger

which are separated by about their own diameter, slightly larger laterally; punctures on elytra rather similar in size, with stria punctures relatively small and weak and not much larger than larger interstitial punctures, which in turn are often not much larger than smaller interstitial punctures; interstitial punctures not confluent, not forming grooves or ridges. Aedeagus as in Fig. 4.

Types

Syntypes, in MNHN. Type locality, Mongers Lake, North Subiaco, Perth, Western Australia; 1, from same series in WAM. Lectotype not designated.

Distribution

Western Australia

Busselton, CW; Bunbury, AM; Camel Lake, WAM; King George Sound, AM; Mogumber, WAM; North Lake, Fremantle, FIELD; Ravensthorpe, ANIC; Swan River, ANIC; SAMA; Swan View, ANIC.

Remarks

Separated from *H. tristis* by the distinctive reddish hue and the comparative uniformity of punctures on the elytra. The aedeagus is distinctive. In the relatively few specimens I have seen there is no hint of elytral grooves or ridges as in some *H. tristis* and virtually all *H. luridus*. Although I saw the types many years ago they are temporarily unavailable and I have relied on my notes and descriptions by Régimbart and d'Orchymont and the illustration of the aedeagus given by d'Orchymont to identify this species. I have not designated a lectotype due to the unavailability of the Paris specimens.

Helochares (Hydrobaticus) thurmerae sp. nov.

Description (number examined 15)

As for *H. tristis* except as follows. Length 3.8–5.0 mm. Reddish-yellow; rear of head, front of pronotum, serial punctures and other areas of upper surface darker. Punctures on head subequal, small for subgenus, separated by half to one times their diameters, somewhat smaller towards front; punctures on pronotum a little denser and stronger than on head; stria punctures on elytra well impressed, much larger than those on pronotum, separate but close to each other, those on disc somewhat smaller than elsewhere including apical declivity; interstitial punctures of uniform size, much smaller than those on pronotum, moderately

impressed, those of lateral fringe larger. Elytra weakly flanged. Aedeagus as in Fig. 9.

Male: Protarsi and claws a little stouter than in female.

Types

Holotype male: 'New Guinea: Morobe Dist., Gusap, Markham, Valley e. 90 ml W. of Lae, 1,000 ft 27-30.i.1965'. 'M.E. Bacehus, BM, 1965-120'. 'Stn. No. 166', in BM(NH).

Paratypes: 4, in BM(NH); 1, in CW; 1, in SAMA, same data as Holotype.

Distribution

Papua New Guinea

Gusap Markham Valley, 145 km W of Lae, BM(NH); Lae, BMNH; 11 km Lae-Bulolo Rd., BM(NH).

Remarks

Known only from a relatively small area of New Guinea. Apart from the aedeagus, *H. thurmerae* can be separated from the rather similar *H. loweryae* and *H. dalhuntii* by the stria punctures being larger and fewer than in those species.

Helochares (Hydrobaticus) tristis Maeleay

Helochares tristis Maeleay, 1871

Hydrobaticus australis Blackburn, 1888; syn. nov.

Description (number examined 250)

Length 3.8-6.1 mm. Oval, widest behind centre of elytra. Yellow-brown. Clypeus, back of head, markings in central panel of pronotum and much of underside darker. Front margin of head shallowly and widely concave. Head and pronotum densely covered with punctures of two sizes, in approximately equal numbers, larger much larger than smaller; punctures denser, larger and more numerous laterally. Elytra similarly punctured (Fig. 20), with, in addition, ten more or less distinct lines of serial punctures; lateral band of punctures on elytron continues strongly to apex. Serial punctures same size or larger than larger interstitial punctures. Pronotum and elytra weakly flanged. Maxillary palpi elongate, first and second segments subequal in length, apical somewhat shorter. Femur with rugose portion covered with short setae, covering all but small portion of apex of femora. Underside rugose punctate. Sternites with covering of short setae; apex of apical

sternite broadly notched, notch with row of stout setae along margin practically filling up area of notch.

Male: Maxillary palpi, tarsi and tarsal claws slightly stouter than in female. Aedeagus as in Fig. 3.

Types

H. tristis: Holotype, ?sex 'Hydrobaticus tristis Mel. W. Gayndah' 'K19621' with small circular red label and red Holotype label, in AM.

H. australis: Syntypes: two male specimens mounted on same card, under the left hand specimen is the number 410 & 'T'. The pin has the following labels; BM(NH) Type label, 'Blackburn coll. 1910-236', 'Hydrobaticus australis Blackb.', in Blackburn's hand, in BM(NH); one labelled '410, Port Lincoln Blackburn, Hydrobaticus australis Blackb., co-type' in SAMA; two mounted on same card labelled '410, Port Lincoln Blackburn, Australis Blackb.' in SAMA (there is an empty card labelled '410' on same pin). I nominate the left hand specimen in the BM(NH) below which is written '410 T' as the lectotype, and the remaining syntypes as paralectotypes. Synonymy is based on examination of types.

Distribution

Northern Territory

Ayers Rock, UQIC; 80 km W Mt Olga, WAM; 160 km W Mt Olga, WAM; Vaughan Springs, CW.

Queensland

Brisbane, UQIC; Brookfield, QM; Cunnamulla, QM; Dalby, QM; Goomeri, UQIC; Green Island, WAM; Jimboomba, ANIC; Malanda, CW; 16 km S Miriam Vale, UQIC; Stanthorpe, BELG, UQIC; Tambourine Mt., QM.

New South Wales

Blowering Dam, ANIC; Cooma, ANIC; 23 km NNE Coonabarabran, ANIC; 15 km S Condobolin, ANIC; Culeairn, ANIC; Deniliquin, ANIC; Forbes, CW; Forest Reefs, SAMA; Kitty's Creek, ANIC; Maeleay River, ANIC; Muswellbrook, ANIC; Native Dog, ANIC; Sydney, BELG, NMV; Yanco Creek, ANIC.

Australian Capital Territory

Aeton, ANIC; Canberra, ANIC; Gungahlin, ANIC; 3 km NW Tharwa, ANIC.

Victoria

Alcxandra, NMV; Anakie, NMV; Avoca, NMV; 11 km NNW Ballan, ANIC; Ballarat, ANIC; Birchip, NMV, UQIC; Dandenong Range, NMV; 34 km E Echuca, ANIC; Ferntree Gully, NMV; Grampians, UQIC; Healesville, CW, NMV; Inglewood, NMV; Iona, ANIC; L. Colac, NMV; L. Punrumbeti, NMV; Lake Hattah, NMV; Latrobe River, NMV; Lilydale, SAMA; Maffra, NMV; 8 km SW Maffra, ANIC; Melbourne, NMV, UQIC; Mitta Mitta River, NMV; Mordialloc, NMV; Mornington, UQIC; Natya, NMV; Preston, NMV; Sea Lake, UQIC; Goudie, UQIC; 13 km SE Shepparton, ANIC; Stawell, CW; Suggar Buggar, NMV; Tynong, NMV; Morwell, ANIC; 4 km W Violet Town, ANIC; Wartook, NMV; Whittlesea, NMV.

Tasmania

Asbestos Range NP, ANIC; East Tamar, SAMA; Launceston, SAMA; Hobart, BELG, NMV, SAMA.

South Australia

Adelaide, CW; Blanchetown, SAMA; Chain of Ponds, CW; 13km N Ernabella, FIELD; Everard Ranges, SAMA; Flinders Ranges, CW; Gawler, SAMA; Gawler Ranges, SAMA; Mannum, CW; Mt Barker, SAMA; Murray River, NMV; Olary, ANIC; Scorpion Springs C.P., SAMA.

Western Australia

8 km S Giles, WAM; Gill's Pinnacle, WAM.

Remarks

Elytra are usually smooth (except for punctures) (Fig. 22) but in some specimens, particularly from more northern localities, the stria punctures are confluent towards apex forming grooves, and in some the interstria areas are ridged accentuating the grooving in a way very similar to *H. luridus*. This species appears to be replaced in south-west Western Australia by *H. tenuistriatus*, a slightly larger species recognisable by its uniform reddish colour and strong interstria punctures. *H. tristis* is sympatric with *H. luridus* in southern Queensland. The difference between these two species is discussed under *H. luridus*.

ACKNOWLEDGMENTS

Without the support of a professional infrastructure this work would have been impossible. I thank the curators of the collections listed earlier for allowing me to examine specimens in their care; Ms D. Churches, Ms R. Cherrington and Mrs V. Wade typed the manuscript; Ms J. Thurmer drew the figures of the male genitalia; Ms J. Forrest took the SEM photographs; Mrs M. Anthony ferreted out obscure references and Dr E. Matthews much improved the manuscript. I thank them for their help in what are perhaps the less exciting aspects of scientific endeavours but nevertheless necessary ones.

REFERENCES

- ANDERSON, J. M. E. 1976. Aquatic Hydrophilidae (Coleoptera): The biology of some Australian species with descriptions of immature stages reared in the laboratory. *Journal of the Australian Entomological Society* **15**: 219–228.
- BLACKBURN, T. 1888. Notes on Australian Coleoptera, with Description of New Species. *Proceedings of the Linnean Society of New South Wales Series 2* **3**: 805–875.
- BLACKBURN, T. 1890. Notes on Australian Coleoptera, with Description of New Species. Part III. *Proceedings of the Linnean Society of New South Wales* **4**(1889): 445–482.
- BLACKBURN, T. 1891. Notes on Australian Coleoptera, with Description of New Species. *Proceedings of the Linnean Society of New South Wales* **5**(1890):303–366.
- BLACKBURN, T. 1896. Coleoptera (exclusive of the Carabidae). Pp. 254–308 in 'Report of the Horn expedition to Central Australia.' No. 78.
- BLACKBURN, T. 1898. Further Notes on Australian Coleoptera with Description of New Genera and Species. XXIV. *Transactions of the Royal Society of South Australia* **22**: 221–233.
- FAUVEL, A. 1883. Les Coléoptères de la Nouvelle – Calédonie et dépendances avec descriptions, notes et synonymies nouvelles. *Revue d'Entomologie Caen* **2**: 335–360.
- HANSEN, M. 1991. The hydrophiloid beetles. Phylogeny, classification and a revision of the genera (Coleoptera, Hydrophilidae). *Biologiske Skrifter* **40**: 368 pp.
- KNISCH, A. 1921. Die exotischen Hydrophiliden des Deutschen Entomologischen Museums (Col.) *Archiv für Naturgeschichte* **85**(1919), A(8): 55–88.
- KNISCH, A. 1924. Hydrophilidae, in 'Coleopterum Catalogus' Pars 79. Ed. Ward S. Schenkling. W. Junk. Berlin. 306 pp.
- MACLEAY, W. 1871. Notes on a collection of insects from Gayndah. *Transactions of the Entomological Society of New South Wales* **2**(1873): 79–205.

- MONTROUZIER, P. 1860. Essai sur la faune entomologique de la Nouvelle-Calédonie et des îles de Pins, Art, Lifu, etc. *Annales de la Société Entomologique de France* (3)8: 229-308.
- MULSANT, E. 1844. Description de quelques Palpicornes inédits. *Annales de la Société Scientifique d'Agriculture de Lyon* 7: 372-382.
- d'ORCHYMONT, A. 1925. Contribution à l'étude des Hydrophilides I. *Bulletin et Annales de la Société Royale Entomologique de Belgique* 65: 63-77.
- d'ORCHYMONT, A. 1927. Notes on the Hydrophilidae in the Federated Malay States Museum. *Journal of the Federation of Malay States Museums* 13: 246-252.
- d'ORCHYMONT, A. 1939. Revision des espèces du sous-genre *Crephelochares* d'*Helochares*. *Bulletin et Annales de la Société Royale Entomologique de Belgique* 79: 154-166.
- d'ORCHYMONT, A. 1943. Nouvelles notes sur les *Helochares* (*Hydrobaticus*). (Coleoptera, Palpicornia, Hydrophilidae). *Bulletin du Musée Royal d'Histoire Naturelle de Belgique* 19: 1-12.
- RÉGIMBART, M. 1903. Coléoptères Aquatiques (Haliplidae, Dytiscidae, Gyrinidae et Hydrophilidae), recueillis dans le sud de Madagascar. *Annales de la Société Entomologique de France* 72: 1-51.
- RÉGIMBART, M. 1908. Dytiscidae, Hydrophilidae et Gyrinidae. Pp. 311-316, in 'Die Fauna sudwest-Australiens'. Eds. Michaelsen and Hartmeyer; Ergebnisse der Hamburgener sud west-Australischen Forschungsreis 1905. I. VIII and 488 pp. Jena.
- SHARP, D. 1882-87. Insecta. Coleoptera Vol. 1, Part 2 (Haliplidae, Dytiscidae, Gyrinidae, Hydrophilidae, Heteroceridae, Parnidae, Georissidae, Cyathoceridae, Staphylinidae), in 'Biologia Centrali-Americana'. Eds. F. D. Godman and O. Salvin (16) 824 pp, London.
- SHARP, D. 1890. On some aquatic Coleoptera from Ceylon. *Transactions of the Entomological Society of London* (1890): 339-359.
- ZAITZEV, F.A. 1908. Catalogue des Coleopteres aquatiques des familles Dryopidae, Georyssidae, Cyathoceridae, Heteroceridae et Hydrophilidae. *Trudy Russkago Entomologicleskago Obshchestva* 30: 283-420.